

REMARKS

Claims 1-12 and 22-32 are active in the case. Reconsideration is respectfully requested.

The present invention as set forth in Claim 1 relates to a hotmelt adhesive for the coating, lamination or coating and lamination of a sheetlike structure by the double dot technique, of which one component is a multitude of upper dots, each dot comprising an amine-terminated crosslinkable copolyamide, and bonded to a second component of a multitude of lower dots on a substrate, each dot comprising an (i) OH-terminated polyester, (ii) a crosslinker, and (iii) an acrylic dispersion, a polyurethane dispersion or an acrylic and polyurethane dispersion.

Claim 29 relates to a method of coating or laminating sheet-like structures, comprising:  
by the double dot technique, bonding a component having a multitude of upper dots, each dot comprising an amine-terminated cross-linkable copolyamide, to a second component of a multitude of lower dots on a substrate, each dot comprising an (i) OH-terminated polyester, (ii) a cross-linker selected from a polyisocyanate compound having more than two reactive groups per molecule, (iii) an acrylic dispersion, a polyurethane dispersion or an acrylic and polyurethane dispersion.

In reply to the final Office Action, Applicants wish to draw the Examiners' attention to the discussion of DE 198 02 809 (US 6,300,413) in the specification of the present invention. In this patent, a polyethylene matrix is used. The Example in the present invention can be used for purposes of comparison.

Example 1 of the present invention, the following results were obtained:

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Primary adhesion: 13 N/5 cm

60°C wash: 10 N/5 cm

Back-riveting: 0.1 N/10 cm.

Comparative Example 1 has the following result:

Primary adhesion: 9 N/5 cm

60°C wash: 5 N/5 cm

Back-riveting: 0.9 N/10 cm.

Comparative Example 2 has the following result:

Primary adhesion: 6 N/5 cm

60°C wash: 3 N/5 cm

Back-riveting: 1.9 N/10 cm.

Further, page 3, lines 24-32 of the specification discloses that :

It has now surprisingly become possible to prepare a very reactive system in accordance with the claims, having an activation temperature in the range from about 100 to 130°C. and having water resistance. The crosslinkable hotmelt adhesive composition according to the invention for the coating and/or lamination of sheetlike structures has the feature that the reactive components present in the hotmelt adhesive composition do not react, with crosslinking, until in the melt.

Further, the specification discloses in the paragraph bridging pages 7 and 8:

The advantage of the new technology is that the lower dot is crosslinked even under the drying conditions and, owing to its amine termination, the upper dot is cross-linked with the lower dot during melting, so giving an optimum attachment. Since there is a sharp increase in the molecular weight of the lower dot following coating, it is no longer able to sink into the knit. In the course of subsequent bonding, the low-viscosity polyamide of the upper dot is compelled to flow against the upper material that is to be bonded, since it is unable to flow off downward, hence giving very high adhesions even with very small amounts of hotmelt adhesive. The parting layer between upper dot and base dot, which hitherto has been the weak point of the

system, especially in the course of laundering, is more resistant to hydrolytic attack than prior systems and therefore exhibits substantially higher stabilities.

**In the present invention, the use of a difficult to produce polyethylene matrix was omitted.** Nevertheless, no crosslinking occurred during coating and the manufacturing temperatures are comparable to known processes and the result after a 60 °C washing are also in the desired range (see the Example).

As mentioned above, the Simon et al patent is discussed in the present specification on page 3 of the text, with reference to the parent German application DE 198 08 809. As explained in the text, *a free isocyanate is stabilized against water by incorporating the isocyanate into an inert polyethylene matrix (col 2, lines 40-42 of patent '413). Subsequently, the polyethylene is ground to a fine state. By this means success is achieved in creating a stable crosslinkable system for the base dot. The disadvantage of this system is the complicated and hence expensive preparation of the water-stable isocyanate. Additionally, the polyethylene matrix hinders the diffusion rate, which signifies a reduction in the reaction rate.* As stated in the first paragraph of column 1 of the '413 patent, the composition of the base dot is an amine terminated copolyamide and a pulverized extrudate consisting of an atactic polyolefin and a pulverulent isocyanate or an epoxide. The bottom of column 2 of the patent states that the isocyanate had to be stabilized against diffusion of atmospheric moisture, in order to ensure its activatability at relatively low temperatures. This has been made possible by binding the isocyanate into a polyolefin polymer at the bottom of column 2 of the patent. Thus, the system of the base dot of the reference provides for the cross-linking of the composition of the base dot.

The base dot system of the present invention differs from that of the '413 in several respects, one of which is that there is no requirement to stabilize an isocyanate crosslinking reactant in a polyolefin matrix. Note that the reference states at column 2, lines 8-9 of the

patent that prior to the invention of the patent it had not been possible to provide a stable cross-linkable system for a base dot. However, because of the stabilization achieved by incorporating the isocyanate reactant or an epoxide into the polyolefin matrix, effective cross-linking within the base dot was achieved.

The specification discloses in the paragraph bridging pages 7 and 8 that the lower dot is crosslinked even under the drying conditions described and, because of the presence of amine groups at the termini of the amine terminated copolyamide component of the upper dot system, the upper dot system is crosslinked with the lower dot during the melting of the dots. This inter-dot bonding, at least in-part results in the improvement of the present invention.

Fiurther, the base dots of the reference are comprised of amine-terminated copolyamide or a copolyester and a pulverized extrudate consisting of atactic polyolefin and a pulverulent isocyanate or an epoxide. On the other hand, the base dot composition of the invention does not comprise a polyolefin extrudate which contains either an epoxide or an isocyanate, but which must specifically be comprised of an OH-terminated polyester, a crosslinker and an acrylic dispersion, a polyurethane dispersion or an acrylic and polyurethane dispersion.

In the present invention, the crosslinker such as a passivated isocyanate or epoxide is only present in the composition of the base dots. Accordingly, the Simon et al patent, does not suggest the present invention as claimed.

The disclosure of Hefe teaches a double dot, hot-melt adhesive composition, wherein the base layer that is comprised of a mixture of a copolyester and a low-pressure polyethylene and a top or covering layer that is comprised of a copolyester or copolyamide or mixtures thereof. From this description it is clear that the base layer of the system of the patent is markedly different from the base dot composition of the present invention, which, as indicated above, is based on the combination of an OH-terminated polyester, a crosslinker

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and an acrylic dispersion, a polyurethane dispersion or an acrylic and polyurethane dispersion. The reference does not suggest the presence of a crosslinker among base layer components. Moreover, the patent clearly requires the combination of a copolyester and a low pressure polyethylene as the adhesive resin components of the base layer, particularly where the combination of polymers is required in a mole ratio of copolyester to low pressure polyethylene ranging from 2:1 to 2:3 (col 3, lines 52-55). No such combination of polymer materials is set forth in the present claims. Thus, the base layer composition of the system of Hefe does not place the teachings of the Simon et al patent closer to the present invention.

Regarding Hefe, the lower or base layer material is not just a copolyester, but is a specific combination of copolyester with low pressure polyethylene, particularly in a mole ratio of 2:1 to 2:3. This low pressure polyethylene component of the Hefe is quite different from the isocyanate or epoxide containing polyolefin extrudate of Simon et al. The Examiner does not seem to recognize this in his comments.

Hefe, Kohlhammer, Mattor, Hiratsuka, and Dobson do not cure the defects of Simon and their combination does not result in the present invention.

The rejections of the claims over Simon, Hefe, Kohlhammer, Mattor, Hiratsuka, and Dobson should be withdrawn.

The matter of the patentability of the subject matter of Claim 29 of a method of coating or laminating sheet-like structures is believed patentable over the cited prior art for the reasons presented above. Withdrawal of the rejection is respectfully requested.

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It is now believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.


Respectfully submitted,

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